

Seven new record species of *Psyllaephagus* (Hymenoptera: Encyrtidae) from China

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Abstract: Seven species of *Psyllaephagus* are recorded from China for the first time: *P. caillardiae* Sugonjaev, *P. colposceniae* Trjapitzin, *P. elaeagni* Trjapitzin, *P. longiventris* Trjapitzin, *P. nartshukae* Trjapitzin, *P. nikolskajae* Trjapitzin and *P. ogazae* Sugonjaev. A key to the Chinese species of *Psyllaephagus* is given and illustrated with photomicrographs of the morphological characters.

Key words: Chalcidoidea; taxonomy; key

中国木虱跳小蜂属七新纪录种记述（膜翅目：跳小蜂科）

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摘要：记述木虱跳小蜂属 *Psyllaephagus* 7 个中国新纪录种：*P. caillardiae* Sugonjaev, *P. colposceniae* Trjapitzin, *P. elaeagni* Trjapitzin, *P. longiventris* Trjapitzin, *P. nartshukae* Trjapitzin, *P. nikolskajae* Trjapitzin, *P. ogazae* Sugonjaev。提供了中国木虱跳小蜂属的分种检索表，并附有形态特征图。

关键词：小蜂总科；分类；检索表

Introduction

Psyllaephagus Ashmead, 1990 is a cosmopolitan genus containing 234 recognized species (Noyes 2014). Nearly all the *Psyllaephagus* species are primary endoparasitoids of the nymphs of Psyllids (Hemiptera: Psylloidea) (Noyes & Hanson 1996; Noyes 2005). Several *Psyllaephagus* species have been successfully used for biological control of psyllids. Among them, *Psyllaephagus yaseeni* Noyes has been introduced into several countries for use against *Heteropsylla cubana* Crawford (Noyes & Hanson 1996), *Psyllaephagus bliteus* Riek was imported from Australia and released in California in a biological control program against the red gum lerp psyllid *Glycaspsis brimblecombei* Moore (Daane *et al.* 2005). *Psyllaephagus parvus* and *Psyllaephagus perplexans* was introduced into southern California to control *Eucalyptolyma maiden* Froggatt and *Cryptoneossa triangula* Taylor (Hemiptera: Psyllidae) (Jones *et al.* 2011).

Tamarix spp. and *Haloxylon* spp. are the dominant plants of Xinjiang which are widely distributed across the desert and semidesert regions, which play important roles in breaking wind and fixing (stabilizing) sand, as well as conserving and improving the ecological

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environment. Psyllids are a groups of the important insect pests of these plants. For instance, *Caillardia robusta* Loginova, *Caillardia azurea* Loginova, *Caillardia nana* Loginova and *Caillardia notate* Loginova, caused leaf-bracted galls in the *Haloxylona mmodendron* and *Haloxylona persicum* in the Gurbantunggut Desert (Li *et al.* 2012). About 10 species of psyllids were observed on the *Tamarix* spp. (Tamaricaceae) in Xinjiang (Meng *et al.* 2005). In this paper, the genus *Psyllaephagus* in the basin deserts of Xinjiang were studied to provide a basis for the biocontrol of psyllids and provide protection of the ecological environment in Xinjiang.

Nine species of *Psyllaephagus* were known in China, including *P. belanensis* Hoffer, 1963, *P. brevicealcaratus* Li, 2010, *P. densiciliatus* Tan & Zhao, *P. latiscapus* Xu, *P. longifuniculus* Xu, *P. longiventra* Li, *P. punctatus* Zhang, *P. stenopsyllae* (Tachikawa), *P. taiwanus* Xu (Ma 2004; Li 2010; Tan & Zhao 1999; Xu *et al.* 2000a, b; Zhang 2001). However, there is less data on this economically important encyrtid genus in Xinjiang. Only one species *Psyllaephagus* sp. was reported from Xinjiang, which had been reared from the nymph of *Caillardia* sp. (Li *et al.* 2012). In this paper, seven species distributed in Xinjiang are reported from China for the first time. All the specimens are deposited in the Insect Collection of College of Life Science and Technology, Xinjiang University, Urumqi, Xinjiang, China (ICXU).

Material and methods

Specimens were collected by sweeping net and preserved in 75% ethanol. Ethanol-preserved specimens were slide-mounted following the method outlined by Noyes (1982), examined with a Nikon Eclipse E200 microscope. The rest specimens were air dried, mounted on card and observed with a Jiangnan SE2000 stereomicroscope. Photographs were obtained using a Scientific Digital micrography system equipped with Nikon Eclipse E200 microscope.

Morphological terminology follows that of Noyes and Hayat (1984), and Gibson *et al.* (1997). Absolute measurements are used for body length (i.e. length of body excluding the ovipositor sheaths), but relative measurements are used for other dimensions. Abbreviations are as follows: AOL—anterior ocellar line, EL—maximum eye length, EW—maximum eye width, F1, F2, etc.—first funicle segment, second funicle segment, etc.; FV—minimum frontovertex width, FWL—fore wing length, FWW—fore wing width, GL—gonostylus (= 3rd valvula) length, HW—maximum head width, MS—malar space, MV—marginal vein, OCL—occipital ocellar line, OL—ovipositor length, OOL—ocular ocellar line, PMV—postmarginal vein, POL—posterior ocellar line, SL—scape length, SV—stigmal vein, SW—maximum scape width.

Taxonomy

Genus *Psyllaephagus* Ashmead, 1900

Psyllaephagus Ashmead, 1900: 382. Type-species: *Encyrtus pachypsyllae* Howard, by original designation.

Neanagyus Girault, 1915: 174. Type-species: *Neanagyus capitatus* Girault, by original designation. Synonymized by Dahms & Gordh, 1997: 305.

Anisodromus Riek, 1962: 283. Type-species: *Anisodromus tarsius* Riek, by original designation. Synonymized by Dahms & Gordh, 1997: 305.

Other synonyms see Noyes & Hanson (1996).

Diagnosis. Body length 1–2 mm; body color metallic green or blue-green; occipital margin rounded; mandible with 1 (usually) or 2 teeth and a broad truncation; axillae meeting medially; mesopleuron not expanded posteriorly so that propodeum is clearly visible in lateral view above hind coxae; marginal vein punctiform to slightly longer than broad, postmarginal vein well developed, linea calva not interrupted. Female: antennae with 6 funicular segments and cylindrical in cross section; clava 2- or 3-segmented; hypopygium not extending to apex of gaster; ovipositor hidden to well exerted. Male: antennae with 6 funicular segments, branched or unbranched, the segments varying from cylindrical with very long setae to broadened and flattened with very short setae; clava unsegmented; phallobase with well developed digiti, each with one to three apical hooks.

Biology. Most species of *Psyllaephagus* are primary parasitoids of psyllids (Hemiptera: Psyllidae), although a few hosts in other psyllid families have been recorded, most notably Triozidae (Noyes 2005). In addition, a few species from Australia have proved to be secondary parasites of other species of the genus *Psyllaephagus* (Riek 1962).

Distribution. *Psyllaephagus* is distributed all over the world, but predominates in the tropical, subtropical, and arid regions (Trjapitzin 2012).

Key to Chinese species of *Psyllaephagus* (females)

1. All coxae darkened..... 2
- At least one pair of coxae not darkened..... 9
2. All funicle segments longer than broad..... *P. longifuniculus* Xu
- At least one segment of funicle shorter than broad, or quadrate..... 3
3. 1st–5th funicle segments a little longer than broad; the 6th segment quadrate..... 4
- 1st–5th funicle segments not longer than broad; the 6th segment broader than long..... 5
4. Postmarginal vein absent; all femora darkened..... *P. ogatae* Sugonjaev
- Postmarginal vein present; only hind femora darkened..... 5
5. Scape about as long as the first 4 funicle segments combined..... *P. stenopsyllae* (Tachikawa)
- Scape longer than the first 4 funicle segments combined..... *P. brevicealcaratus* Li
6. All femora and tibiae at least partly darkened..... *P. nartshukae* Trjapitzin
- Only hind femora darkened..... 7
7. All funicle segments broader than long..... *P. nikolskajae* (Trjapitzin)
- Funicle segments otherwise..... 8
8. 1st–2nd funicle segments slightly longer than broad; 3rd–5th subquadrate; the 6th broader than long.....
- *P. belanensis* Hoffer
- 1st funicle segment slightly longer than broad; 2nd–5th quadrate; the 6th slightly broader than long.....
- *P. longiventra* Li
9. Ocelli forming an obtuse triangle..... *P. punctatus* Zhang
- Ocelli forming a right or acute triangle..... 10
10. Ocelli forming an acute triangle..... 11
- Ocelli forming a right triangle..... 12

11. Tegulae pale yellow at base 1/2, other wise dark brown; 1st–5th funicle segments slightly longer than broad, the 6th segment quadrate..... *P. Elaeagni* Trjapitzin
 -. Tegulae pale yellow at base 3/4, other wise dark brown; 1st–6th funicle segments broader than long.....
 *P. colposceniae* Trjapitzin
 12. All funicle segments longer than broad..... *P. densiciliatus* Tan et Zhao
 -. Not all funicle segments longer than broad..... 13
 13. The 1st funicle segment quadrate; 2nd–5th funicle segments broader than long; the 6th segment subquadrate..... *P. taiwanus* Xu
 -. 1st–4th funicle segments longer than broad..... 14
 14. Gaster nearly twice as long as thorax..... *P. Longiventris* (Trjapitzin)
 -. Gaster at most a little longer than thorax..... 15
 15. Tegulae pale yellow at base 1/2, other wise dark brown; scape about $2.4 \times$ longer than broad.....
 *P. latiscapus* Xu
 -. Tegulae pale yellow; scape about $4 \times$ longer than broad..... *P. Caillardiae* Sugonjaev

1. *Psyllaephagus caillardiae* Sugonjaev, 1968 (Fig. 1), new record to China

Psyllaephagus caillardiae Sugonjaev, 1968: 592.

Description. Female, body length about 1.3–1.8 mm, metallic green. Antenna with scape and pedicel dark brown, flagellum yellow; tegulae pale yellow; mesoscutum, scutellum and axillae with blue-golden-red coppery sheen; legs (Figs. 1C, E, F) pale yellow, with proximal part of mid coxae and hind coxae dark brown; wings hyaline.

Head about $2.4 \times$ as wide as frontovertex; head finely reticulate, overlaid with regularly spaced shallow punctuations; ocelli forming a right-angled triangle; OCL about $1.7 \times$ the diameter of posterior ocellus; OOL about $0.5 \times$ the diameter of posterior ocellus; antenna (Fig. 1A) with scape $4.0 \times$ as long as wide; pedicel about $1.6 \times$ as long as wide; F1–F5 longer than broad, F6 quadrate; clava 3-segmented, $2.1 \times$ as long as wide.

Mesoscutum dorsally with reticulate sculpture similar to that on scutellum (Fig. 1B); mesoscutum and scutellum covered the same dense short silvery setae; forewing venation see Fig. 1D, basal cell mostly bare, with only 1 complete lines of setae basad linea calva and 6–8 setae below the line; mid tibia spur $0.5 \times$ as long as basitarsus.

Gaster $1.3 \times$ as long as thorax; cercal plates located in the 2/5 of gaster; hypopygium reaching about 2/5 of gaster; ovipositor (Fig. 1G) slightly exserted; OL about $4.6 \times$ as long as GL.

Male. Unknown.

Biology. This species is the parasitoid of psyllids *Caillardia azurea*, *Caillardia notate*, *Caillardia robusta*, which are associated with the plants *Haloxylon aphyllum* and *Haloxylon persicum* (Trjapitzin 1989).

Distribution. China (Xinjiang); Kazakhstan; Mongolia; Tajikistan; Turkmenistan; Uzbekistan.

Specimens examined. 5♀, **China**, Xinjiang, Shihezi, 361 m, 21-VII-2012, coll. Hongying HU's group; 8♀, **China**, Xinjiang, Karamay, 251 m, 25-VII-2012, coll. Hongying HU's group; 1♀, **China**, Xinjiang, Hoboksar County, 609 m, 02-VIII-2012, coll. Hongying HU's group.

Comments. *P. caillardiae* is close to *Psyllaephagus latiscapus*, but can be distinguished

by the following combined characters: 1) antennal clava as long as F4, F5 and F6 combined, the latter with clava as long as F5 and F6 combined; 2) scape $4 \times$ as long as wide, the latter with scape $2.4 \times$ as long as wide; 3) the MV of forewing quadrate, the latter with the MV longer than broad. (Xu *et al.* 2000a). All of these species were swept from locations with *Haloxylon* spp. *Caillardia azurea*, *C. notata* and *C. robusta* cause leaf-bracted galls in the *Haloxylon* spp. in Xinjiang. So the relationship between parasitoids and host can be certain.



Figure 1. *Psyllaephagus caillardiae* Sugonjaev, ♀. A. Antenna; B. Thorax, dorsal view; C. Fore leg; D. Fore wing; E. Mid leg; F. Hind leg; G. Ovipositor.

2. *Psyllaephagus colposceniae* Trjapitzin, 1969 (Fig. 2), new record to China

Psyllaephagus colposceniae Trjapitzin, 1969: 52.

Description. Female, body length about 1.0 mm, metallic green. Antenna with scape and

most of pedicel dark brown, flagellum brown; mesoscutum and axillae with blue and golden sheen; scutellum with blue sheen; tegula pale yellow; legs (Figs. 2D, F) pale yellow, mid coxae, hind coxae and femora dark brown; wings hyaline.

Head about $2.8 \times$ as wide as frontoververtex; head with reticulate sculpture; ocelli forming an acute-angled triangle; OCL about $1.4 \times$ the diameter of posterior ocellus; OOL about $0.2 \times$ the diameter of posterior ocellus; mandible with one tooth and a broad truncation; antenna (Fig. 2A) with scape $5.0 \times$ as long as wide; pedicel about $1.5 \times$ as long as wide; F1–F6 broader than long; clava with 3-segmented, $2.3 \times$ as long as wide.

Mesoscutum dorsally with reticulate sculpture similar to that on frontoververtex; sculpture on scutellum deeper than that on mesoscutum (Fig. 2B), longitudinal sculpture on the two sides of scutellum; forewing venation see Fig. 2C, basal cell with sparse setae; mid tibia spur $0.6 \times$ as long as basitarsus.

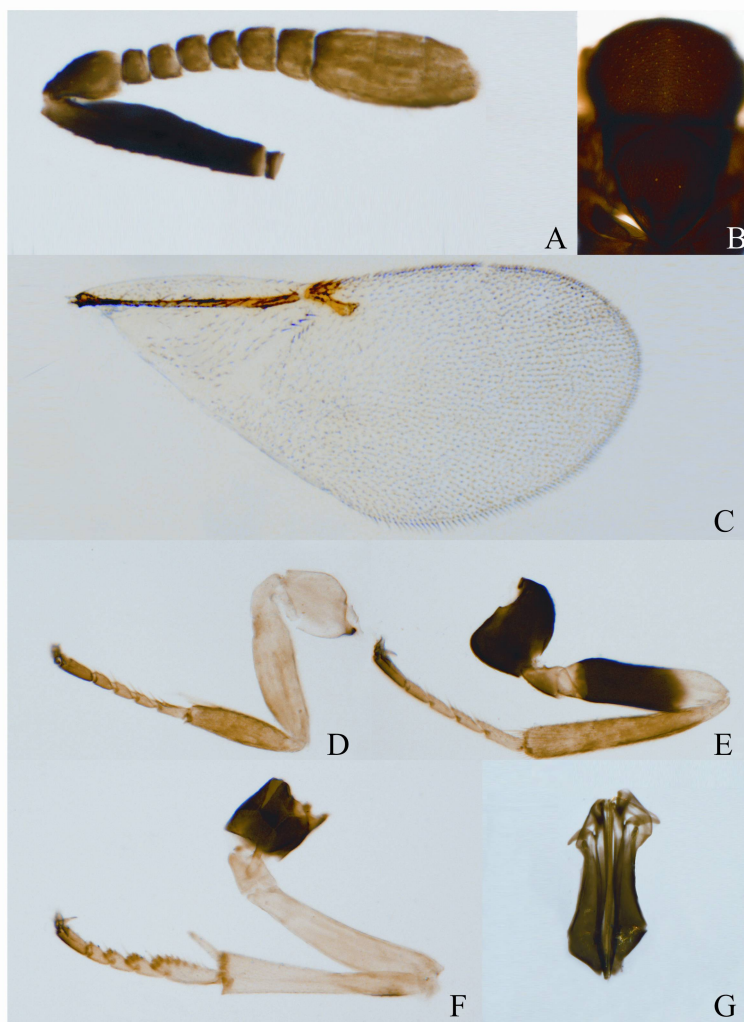


Figure 2. *Psyllaephagus colposceniae* Trjapitzin, ♀. A. Antenna; B. Thorax, dorsal view; C. Fore wing; D. Fore leg; E. Hind leg; F. Mid leg; G. Ovipositor.

Gaster slightly shorter than thorax; cercal plates located in the 1/2 of gaster; hypopygium reaching 2/3 of gaster; ovipositor (Fig. 2G) not exerted; OL about $3.7 \times$ as long as GL.

Male. Unknown.

Biology. It is the parasite of *Colposcenia kiritshenkoi* which is associated with *Tamarix ramosissima* (Myartseva 1984).

Distribution. China (Xinjiang); Kazakhstan; Moldova; Turkmenistan.

Specimens examined. 1♀, **China**, Xinjiang, Karamay, 331 m, 23-VII-2012, coll. Hongying HU's group; 1♀, Xinjiang, Karamay, 274 m, 28-VII-2012, coll. Hongying HU's group; 1♀, Xinjiang, Hami, 1128 m, 01-VIII-2012, coll. Hongying HU's group.

Comments. *P. colposceniae* is similar to *P. taiwanus* Xu (Xu *et al.*, 2000b), but can be distinguished by the following combined characters: 1) F6 wider than long, the latter with F6 subquadrate; 2) ocelli forming an acute-angled triangle, the latter a right-angled triangle; 3) mid femora yellow, the latter more or less darkened. This species was swept from areas where there is a distribution of *Tamarix* spp. The psyllids *Colposcenia vicina* are found on *Tamarix* spp. in Xinjiang. Whether there is a connection between this species and the psyllids *Tamarix* spp. in Xinjiang needs further study.

3. *Psyllaephagus elaeagni* Trjapitzin, 1967 (Fig. 3), new record to China

Psyllaephagus elaeagni Trjapitzin, 1967: 192.

Psyllaephagus bachardenicus Myartseva, 1980: 50. Synonymized by Japoshvili, 2005: 141.

Psyllaephagus rubriscutellatus Myartseva, 1981: 14. Synonymized by Japoshvili, 2005: 141.

Description. Female: body length 1.0 mm, metallic green. Antenna with scape and pedicel dark brown, funicular segments brown except F6 yellow; mesoscutum with red coppery sheen; axillae and scutellum with blue sheen; tegula yellow, dark brown apically; mesopleuron metallic green with golden sheen; legs (Figs. 3D, F) pale yellow, mid and hind coxae, hind femora and subbasal of tibiae dark brown; wings hyaline.

Head about $2.5 \times$ as wide as frontovertex; head with reticulate sculpture; ocelli forming a right-angled triangle; OCL about $1.7 \times$ the diameter of posterior ocellus; OOL about $0.8 \times$ the diameter of posterior ocellus; antenna (Fig. 3A) with scape $5.6 \times$ as long as wide; pedicel about $1.8 \times$ as long as wide; antenna with F1 slightly longer than broad, F2–F5 longer than broad, F6 quadrate; clava 3-segmented, $2.4 \times$ as long as wide; mandible with one tooth and a broad truncation.

Mesoscutum dorsally with reticulate sculpture similar to that on frontovertex; sculpture on scutellum deeper than that on mesoscutum; forewing venation see Fig. 3C, basal cell almost entirely setose; mid tibia spur $0.4 \times$ as long as basitarsus.

Gaster slightly longer than thorax; cercal plates located in the 1/2 of gaster; hypopygium more or less reaching the 2/3 of gaster; ovipositor (Fig. 3B) not exerted; OL about $4.7 \times$ as long as GL.

Male. Unknown.

Biology. Unknown.

Distribution. China (Xinjiang); Armenia; Turkmenistan; Kazakhstan.

Specimens examined. 2♀, **China**, Xinjiang, Hoboksar County, 653 m, 26-VII-2012, coll. Hongying HU's group; 18♀, Xinjiang, Qitai County, 829 m, 29-VII-2012, coll. Hongying HU's group; 49♀, Xinjiang, Mori County, 761 m, 29-VII-2012, coll. Hongying HU's group.

Comments. This species was swept from an area where there is a distribution of *Peganum harmala* Linn. Whether there is a connection between this species and *P. harmala* in Xinjiang needs further study.

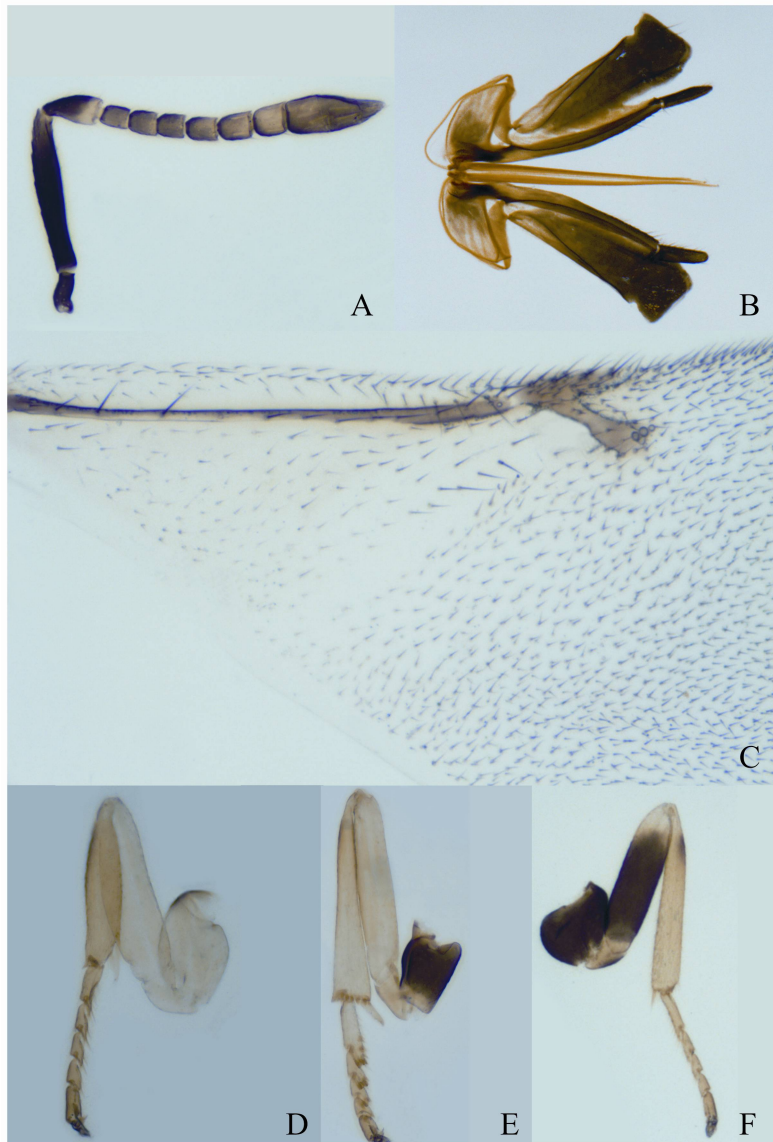


Figure 3 *Psyllaephagus elaeagni* Trjapitzin, ♀. A. Antenna; B. Ovipositor; C. Fore wing; D. Fore leg; E. Mid leg; F. Hind leg.

4. ***Psyllaephagus longiventris* Trjapitzin, 1964** (Fig. 4), new record to china

Kaszabicyrtus longiventris (Trjapitzin), 1972: 372. Synonymized by Szelényi, 1972: 372.

Psyllaephagus longiventris (Trjapitzin), 1964: 237.

Description. Female: body length about 2.3 mm, body metallic green. Antenna with scape and pedicel dark brown, flagellum yellow; thorax dorsally with blue sheen; tegula pale yellow;

mesopleuron with coppery sheen; leg (Figs. 4C, E, F) pale yellow, with proximal part of mid coxae and hind coxae dark brown; wings hyaline.

Head about $2.5 \times$ as wide as frontovertex; head with finely reticulate, overlaid with regularly spaced shallow punctuations; OCL about $1.1 \times$ the diameter of posterior ocellus; OOL about $0.7 \times$ the diameter of posterior ocellus; antenna (Fig. 4A) with scape about $4.2 \times$ as long as broad; pedicel about $1.5 \times$ as long as wide; funicle with F1–F4 longer than broad, F5–F6 subquadrate; clava 3-segmented, $2.2 \times$ as long as wide; mandible with two teeth and a broad truncation.

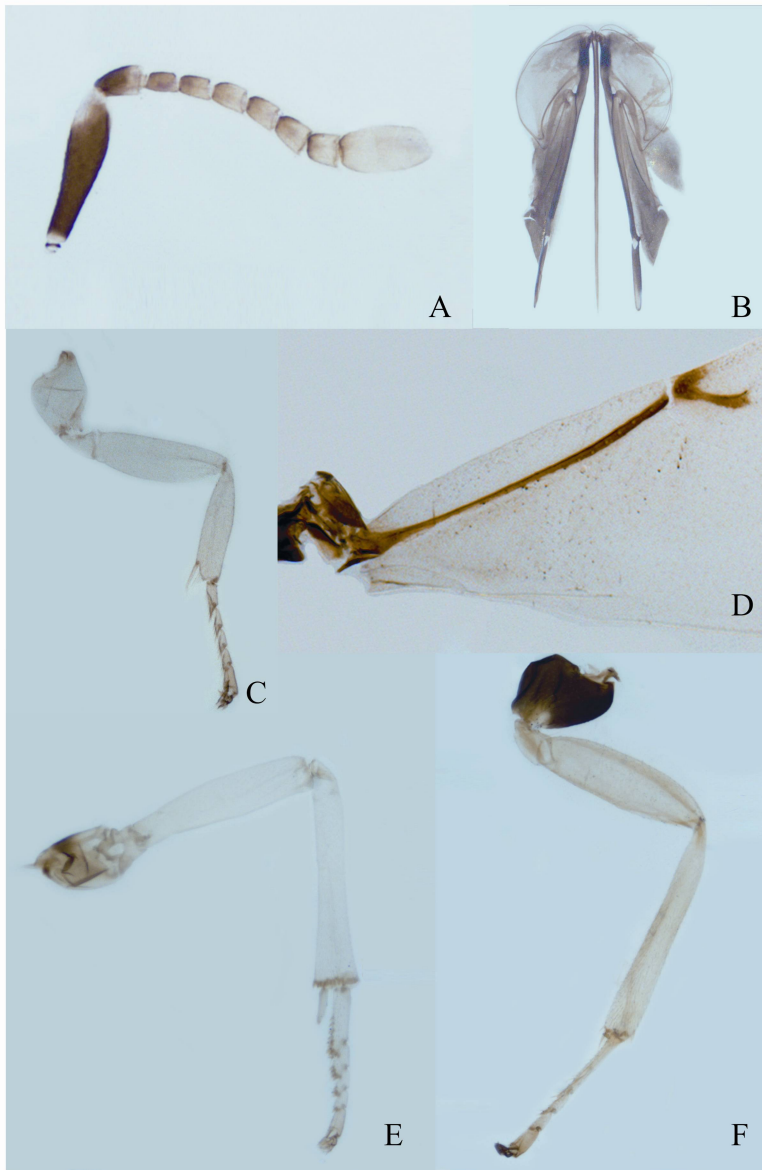


Figure 4. *Psyllaephagus longiventris* Trjapizin, ♀. A. Antenna; B. Ovipositor; C. Fore leg; D. Fore wing; E. Mid leg; F. Hind leg.

Mesoscutum and scutellum dorsally with reticulate sculpture similar to that on frontovertex, mesoscutum and scutellum covered the same dense short silvery setae; fore wing with basal cell almost entirely setose, but a little more sparse proximally, fore wing venation see Fig. 4D; mid tibia spur $0.5 \times$ as long as basitarsus.

Gaster nearly twice as long as thorax; cercal plates located in the $1/2$ of gaster; hypopygium reaching about $1/2$ of gaster; ovipositor (Fig. 4B) exerted, the exerted part about $1/10$ of gaster length; OL about $4.1 \times$ as long as GL.

Male. Unknown.

Biology. It is a parasite of *Caillardia robusta* which is associated with *Haloxylon* (Trjapitzin 1989).

Distribution. China (Xinjiang); Kazakhstan; Mongolia; Turkmenistan; Uzbekistan.

Specimens examined. 2♀, **China**, Xinjiang, Turpan, Aiding Lake, -133 m, 03-VIII-2012, coll. Hongying HU's group; 1♀, China, Xinjiang, Turpan, Grape country, -43 m, 03-VIII-2012, coll. Hongying HU's group.

5. *Psyllaephagus nartshukae* Trjapitzin, 1986 (Fig. 5), new record to China

Psyllaephagus nartshukae Trjapitzin, 1986: 62. Compared with *Psyllaephagus georgicus* by Yasnosh & Japoshvili, 1999: 519.

Description. Female: body length about 1.0 mm, metallic green. Antenna with scape and pedicel dark brown, flagellum yellow-brownish; mesoscutum with coppery sheen at basal $1/4$, otherwise with blue sheen; scutellum blue green; axillae with blue and purple sheen; tegula yellow at base, otherwise dark brown; leg (Figs. 5E, G) pale yellow, all femora and tibiae at least in part dark brown; wings hyaline.

Head about $3 \times$ as wide as frontovertex; head with reticulate sculpture; ocelli forming an right-angled triangle; OCL about $1.3 \times$ the diameter of posterior ocellus; OOL about $0.2 \times$ the diameter of posterior ocellus; antenna (Fig. 5A) with scape $3.7 \times$ as long as wide; pedicel about $1.5 \times$ as long as wide; F1–F6 broader than long; clava 3-segmented, $1.9 \times$ as long as wide; mandible with two teeth and a broad truncation.

Mesoscutum dorsally with reticulate sculpture similar to that on frontovertex; sculpture on scutellum deeper than that on mesoscutum, longitudinal sculpture on the two sides of scutellum (Fig. 5B); fore wing venation see Fig. 5C, basal cell mostly bare, with only 2 complete lines of setae basad linea calva; mid tibia spur $0.5 \times$ as long as basitarsus.

Gaster obviously shorter than thorax; cercal plates located on the $2/5$ of gaster, hypopygium reaching about $2/3$ of gaster; ovipositor (Fig. 5D) slightly exerted; OL about $4.7 \times$ as long as GL.

Male. Unknown.

Biology. Unknown.

Distribution. China (Xinjiang); Kyrgyzstan.

Specimens examined. 2♀, **China**, Xinjiang, Shihezi, 148 m, 21-VIII-2012, coll. Hongying HU's group; 2♀, Xinjiang, Hoboksar County, 515 m, 26-VIII-2012, coll. Hongying HU's group.

Comments. This species was swept from an area with a distribution of *Tamarix* spp. Whether there is a connection between this species and *Tamarix* spp. in Xinjiang needs further study.

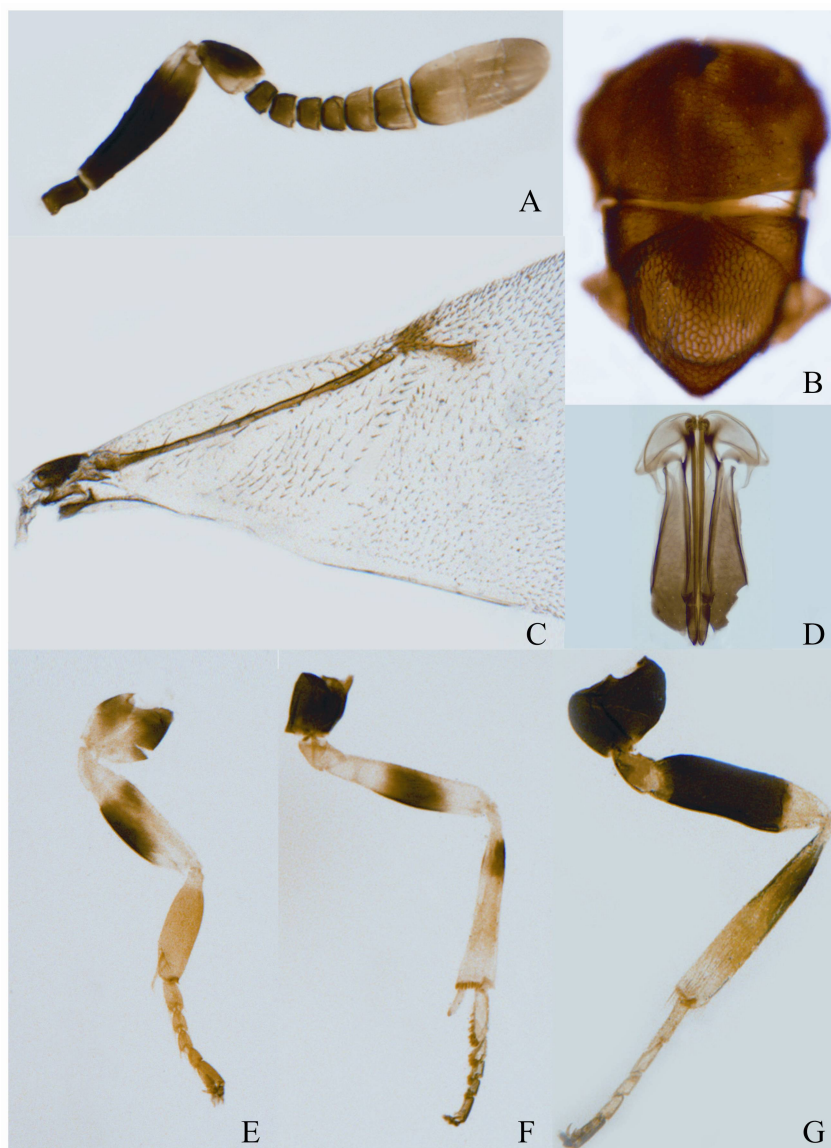


Figure 5. *Psyllaephagus nartshukae* Trjapitzin, ♀. A. Antenna; B. Thorax, dorsal view; C. Fore wing; D. Ovipositor; E. Fore leg; F. Mid leg; G. Hind leg.

6. *Psyllaephagus nikolskajae* (Trjapitzin), 1964 (Fig. 6), new record to China

Calluniphilus nikolskajae Trjapitzin, 1964: 238.

Psyllaephagus nikolskajae (Trjapitzin), 1964: 259. New combination for *Calluniphilus nikolskajae* Trjapitzin.

Description. Female: body length about 1.0 mm, metallic green. Antenna with scape dark brown; pedicel yellow, basal half dark brown; flagellum yellow; mesoscutum and scutellum with blue sheen; axillae with purple sheen; tegula pale yellow; legs (Figs. 6D, F, G) pale yellow, all coxae and hind femora dark brown; wings hyaline.

Head about $2.5 \times$ wide as frontovertex; head finely reticulate, overlaid with regularly

spaced shallow punctuations; OCL about $0.9 \times$ the diameter of posterior ocellus; OOL about $0.6 \times$ the diameter of posterior ocellus; mandible with two teeth and a broad truncation; antenna (Fig. 6A) with scape $5.0 \times$ as long as wide; pedicel about $1.6 \times$ as long as wide; F1–F6 broader than long; clava with 3-segmented not obvious; mandible with two teeth and a broad truncation.

Mesoscutum and scutellum dorsally with reticulate sculpture similar to that on frontovertex (Fig. 6B); fore wing venation see Fig. 6C, basal cell mostly bare, with only 2 complete line of setae basad linea calva and 2–3 setae below the line; mid tibia spur $0.6 \times$ as long as basitarsus.

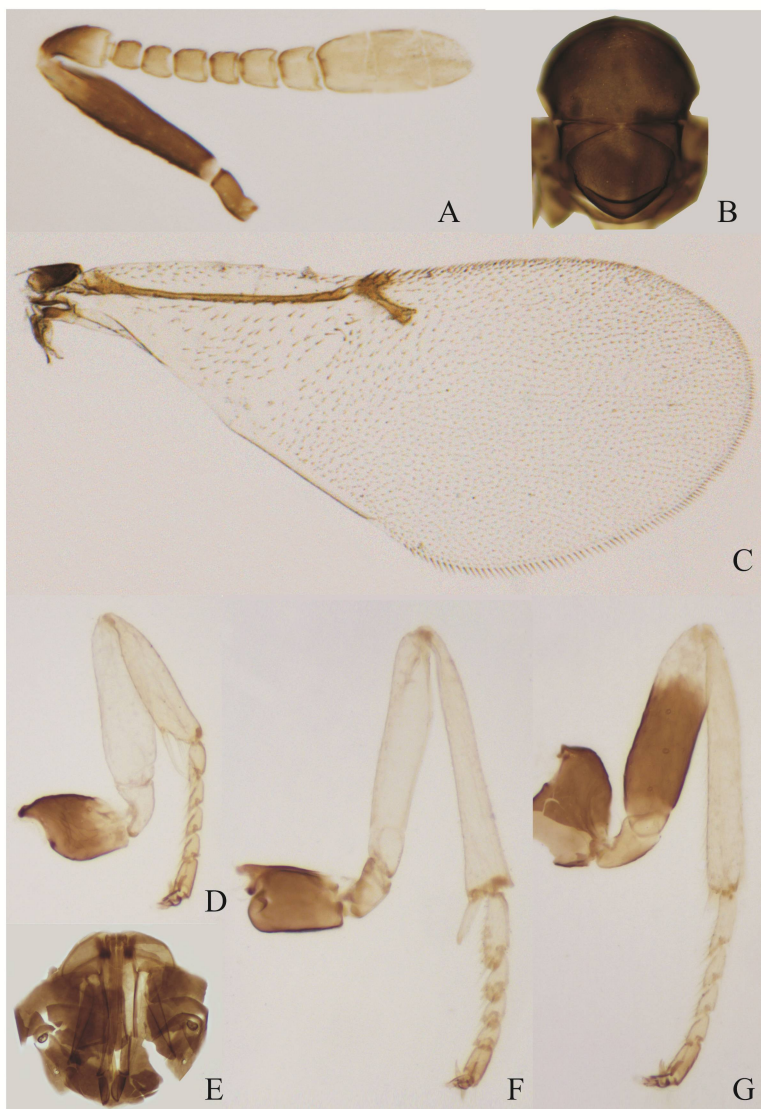


Figure 6. *Psyllaephagus nikolskajae* (Trjapizin), ♀. A. Antenna; B. Thorax, dorsal view; C. Fore wing; D. Fore leg; E. Ovipositor; F. Mid leg; G. Hind leg.

Gaster slightly shorter than thorax; cercal plates located in the 1/2 of gaster; hypopygium with apex more or less reaching 2/3 of gaster; ovipositor (Fig. 6E) not exerted; OL about $5.3 \times$ as long as GL.

Male. Unknown.

Biology. Unknown.

Distribution. China (Xinjiang); Kazakhstan.

Specimens examined. 1♀, **China**, Xinjiang, Shihezi, 361 m, 21-VII-2012, coll. Hongying HU's group; 2♀, Xinjiang, Hoboksar County, 609 m, 26-VII-2012, coll. Hongying HU's group; 1♀, Xinjiang, Mori County, 874 m, 30-VII-2012, coll. Hongying HU's group; 48♀, Xinjiang, Manas County, 360 m, 21-VII-2012, coll. Hongying HU's group; 58♀, Xinjiang, Kuitun, 515 m, 26-VII-2012, coll. Hongying HU's group.

7. *Psyllaephagus ogazae* Sugonjaev, 1968 (Fig. 7), new record to China

Psyllaephagus ogazae Sugonjaev, 1968: 593.

Description. Female: body length about 1.9 mm, body color red coppery. Antenna with scape and pedicel dark brown; flagellum from basal segment to apical segment yellow-brown to yellow; the apical part of scutellum with metallic green sheen; mesopleuron with metallic green sheen; tegula basal 1/4 pale yellow, otherwise dark brown; coxa and femur dark brown, fore and mid tibia dark brown at subbase, hind tibia dark brown over basal 0.6, legs (Figs. 7E, G) dark brown, apical part of tibiae, tarsus yellow; wings hyaline.

Head about $3 \times$ as wide as frontovertex; head with reticulate sculpture; ocelli forming a right-angled triangle; OCL about $1.0 \times$ the diameter of posterior ocellus; OOL about $0.2 \times$ the diameter of posterior ocellus. Antenna (Fig. 7A) with scape $4.5 \times$ as long as wide; pedicel about $1.5 \times$ as long as wide; antenna with F1–F5 longer than broad, F6 quadrate; clava 3-segmented, $1.9 \times$ as long as wide; mandible with two teeth and a broad truncation.

Mesoscutum dorsally with reticulate sculpture similar to that on frontovertex; scutellum with more deeper, longer and thinner reticulate sculpture (Fig. 7C); fore wing venation see Fig. 7B, postmarginal vein absent, basal cell mostly bare, with only 1 complete line of setae basad linea calva; mid tibia spur $0.6 \times$ as long as basitarsus.

Gaster about $0.7 \times$ as long as thorax; cercal plates located in the 2/3 of gaster; hypopygium reaching about 1/2 of gaster; ovipositor (Fig. 7D) not exerted; OL about $5.3 \times$ as long as GL.

Male. Generally similar to female but for antenna and genitalia; antenna yellow except pedicel dark brown; legs yellow, mid and hind coxae dark brown, hind femur and tibiae dark brown; head about $2.2 \times$ as wide as frontovertex; ocelli arranged in a obtuse-angled triangle; scape expanded and flattened; pedicel short; flagellum clearly flattened.

Biology. Parasites of *Caillardia notata* and *Caillardia robusta* which are associated with *Haloxylon* (Trjapitzin 1989).

Distribution. China (Xinjiang); Kazakhstan; Mongolia; Tajikistan; Turkmenistan; USSR; Uzbekistan.

Specimens examined. 1♀3♂, **China**, Xinjiang, Hoboksar County, 609 m, 26-VII-2012, coll. Hongying HU's group; 1♀, Xinjiang, Hoboksar County, 776 m, 26-VII-2012, coll. Hongying HU's group.

Comments. *P. ogazae* is rather similar to *Psyllaephagus euphyllurae* Masi, but can be

distinguished by the following combined characters: 1) Postmarginal vein is absent, the latter postmarginal vein about 2/3 the length of stigma vein; 2) frontovertex and mesoscutum with the same sculpture, scutellum with thin and long reticulate sculpture, the latter frontovertex and scutellum with the same reticulate sculpture, mesoscutum with scale like reticulate sculpture; 3) mesoscutum and scutellum red coppery, the latter mesoscutum black-green, scutellum green (Sugonjaev 1968).



Figure 7. *Psyllaephagus ogazae* Sugonjaev, ♀. A. Antenna; B. Fore wing; C. Thorax, dorsal view; D. Ovipositor; E. Fore leg; F. Mid leg; G. Hind leg.

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